

Monetary *Trends*

November 2013

This publication contains charts and tables
compiled by the Data Desk staff
of the Federal Reserve Bank of St. Louis.

The data are related to U.S. monetary and financial conditions,
with an emphasis on various measures of the monetary policy stance.



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Conventions used in this publication:

1. Unless otherwise indicated, data are monthly.
2. Shaded areas indicate recessions, as determined by the National Bureau of Economic Research.
3. *Percent change at an annual rate* is the simple, not compounded, monthly percent change multiplied by 12. For example, using consecutive months, the percent change at an annual rate in x between month $t-1$ and the current month t is: $[(x_t/x_{t-1})-1] \times 1200$. Note that this differs from *National Economic Trends*. In that publication, monthly percent changes are compounded and expressed as annual growth rates.
4. The *percent change from year ago* refers to the percent change from the same period in the previous year. For example, the percent change from year ago in x between month $t-12$ and the current month t is: $[(x_t/x_{t-12})-1] \times 100$.

We welcome your comments addressed to:

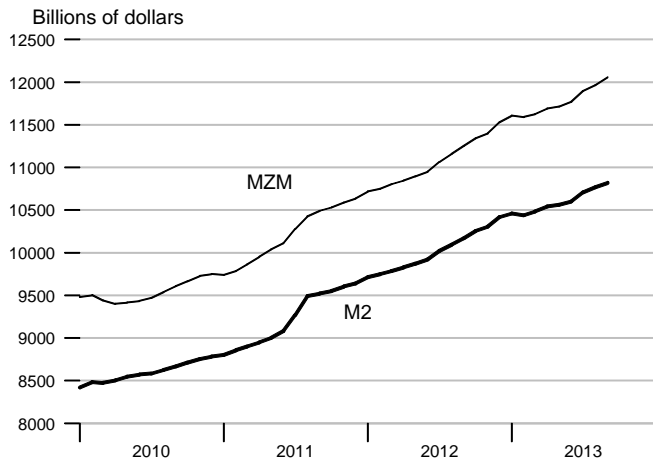
Editor, *Monetary Trends*
Research Division
Federal Reserve Bank of St. Louis
P.O. Box 442
St. Louis, MO 63166-0442

or to:

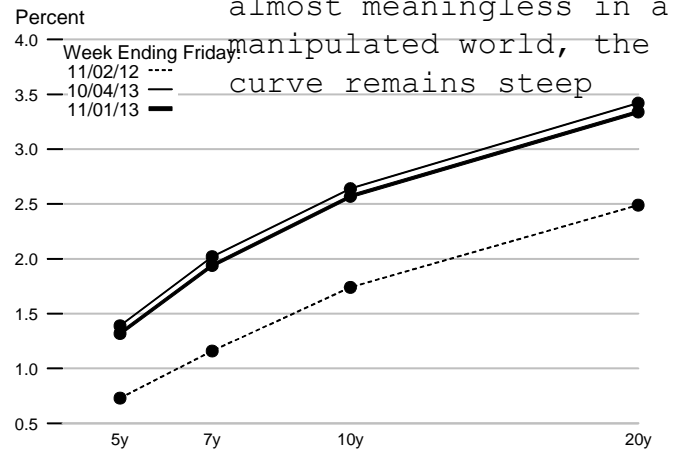
stlsFRED@stls.frb.org

On March 23, 2006, the Board of Governors of the Federal Reserve System ceased the publication of the M3 monetary aggregate. It also ceased publishing the following components: large-denomination time deposits, RPs, and eurodollars.

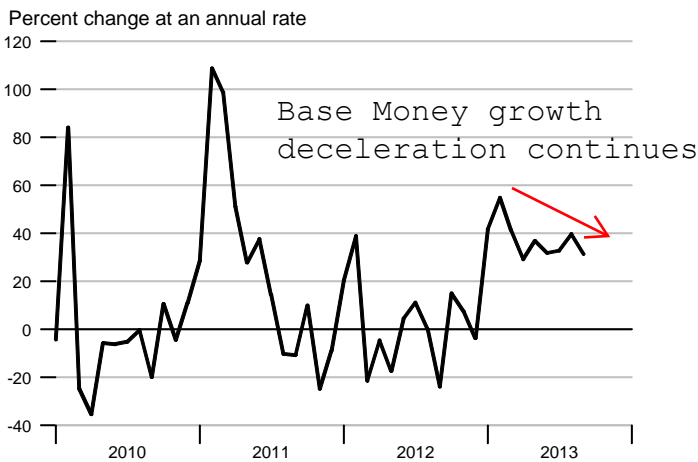
M2 and MZM



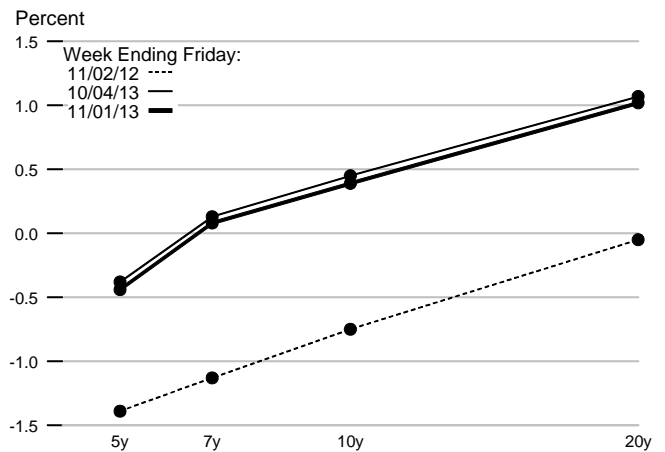
Treasury Yield Curve



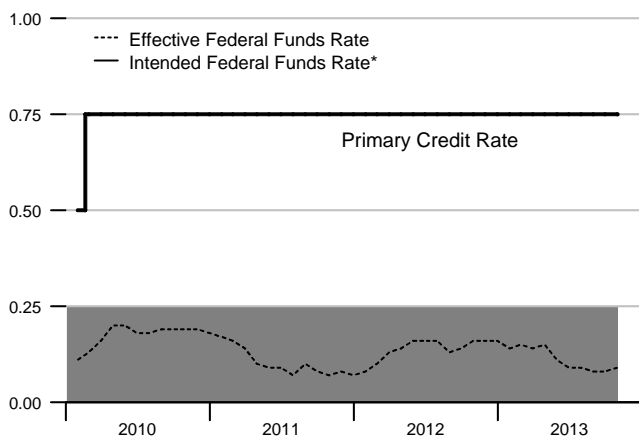
Adjusted Monetary Base



Real Treasury Yield Curve

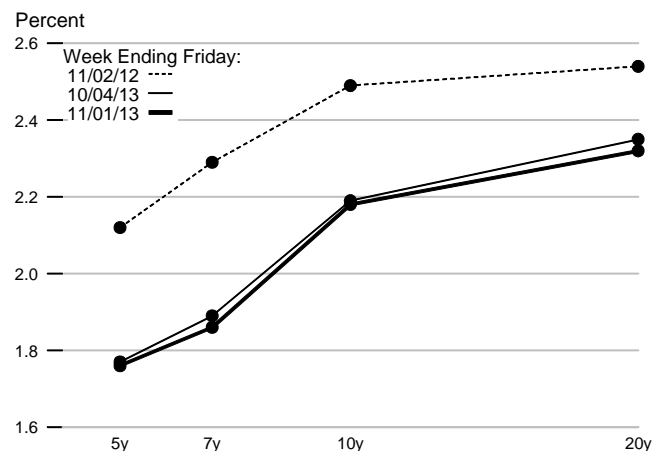


Reserve Market Rates



*Note: Effective December 16, 2008, FOMC reports the Intended Federal Funds Rate as a range. Currently, Intended Federal Funds Rate is not plotted on this chart due to the note above.

Inflation-Indexed Treasury Yield Spreads

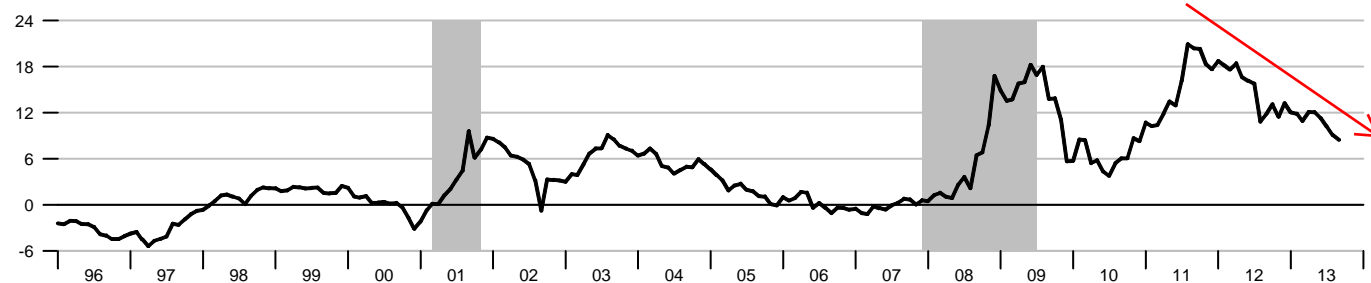


Monetary Trends

All money stock growth figures continue to decelerate, suggesting that a taper of sorts remains in going, also suggests diminished odds of a real Fed taper. updated through 11/05/13

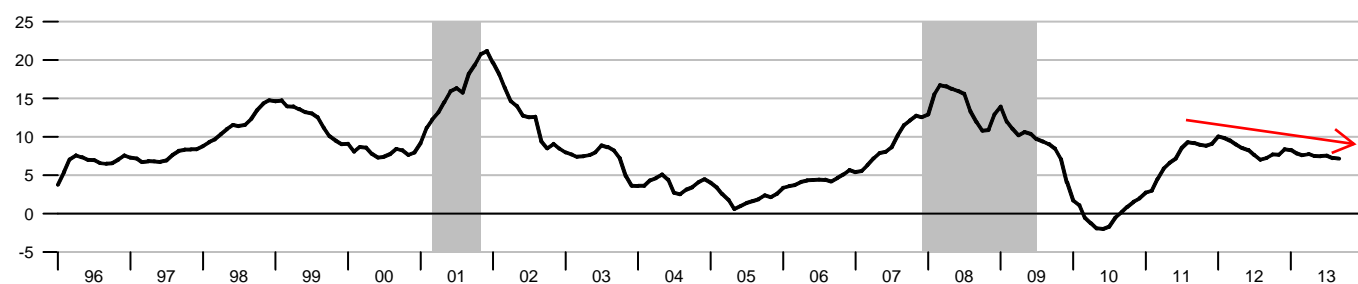
M1

Percent change from year ago



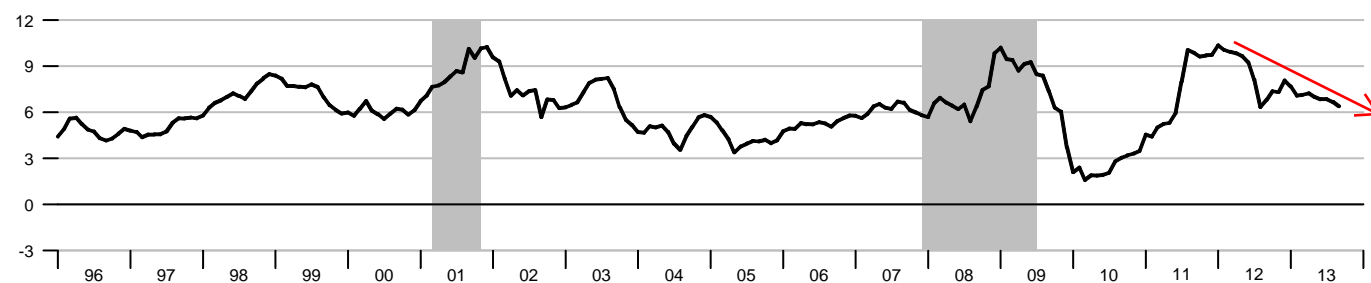
M2M

Percent change from year ago



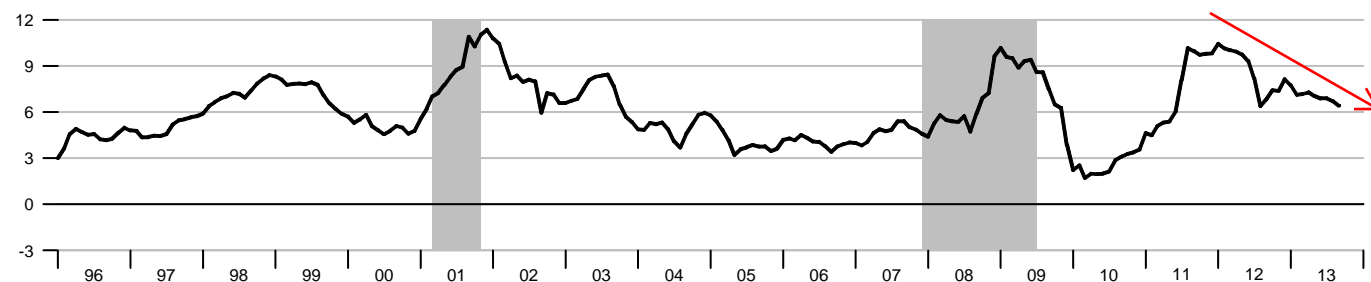
M2

Percent change from year ago



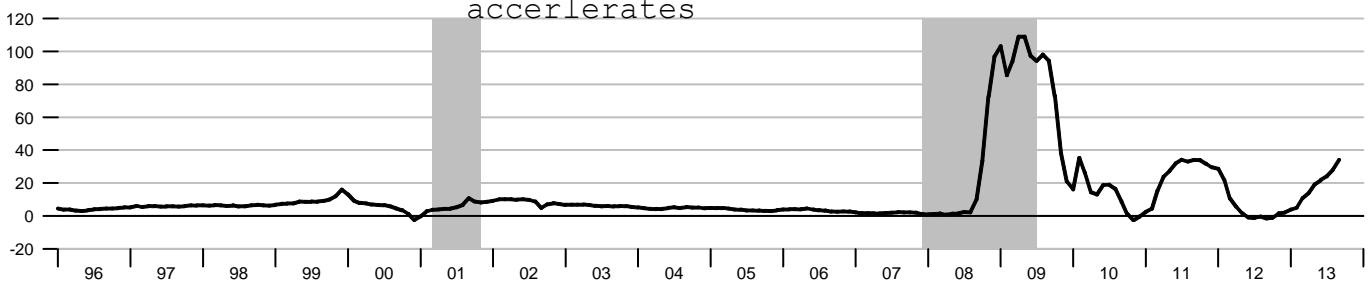
Monetary Services Index - M2

Percent change from year ago



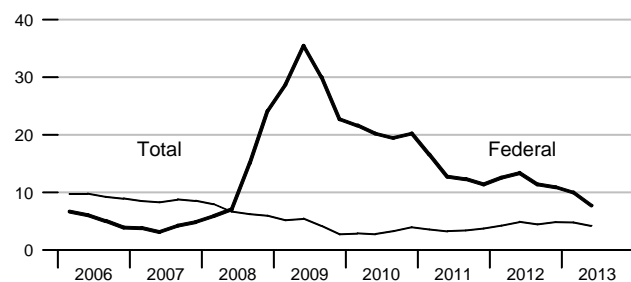
Adjusted Monetary Base

Percent change from year ago



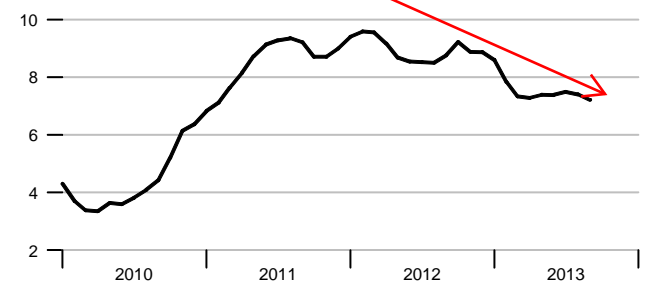
Domestic Nonfinancial Debt

Percent change from year ago



Currency Held by the Nonbank Public

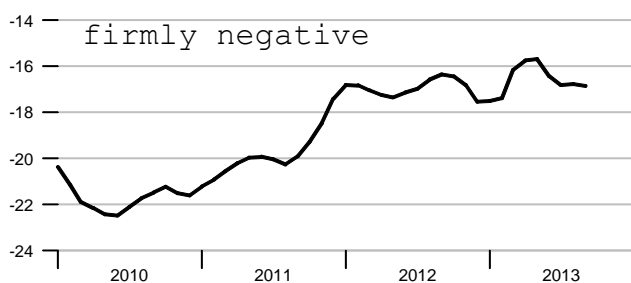
Percent change from year ago



with loan growth slowing, where is created oney going?

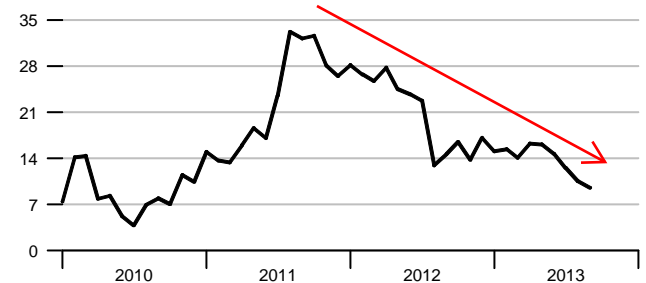
Small Denomination Time Deposits

Percent change from year ago



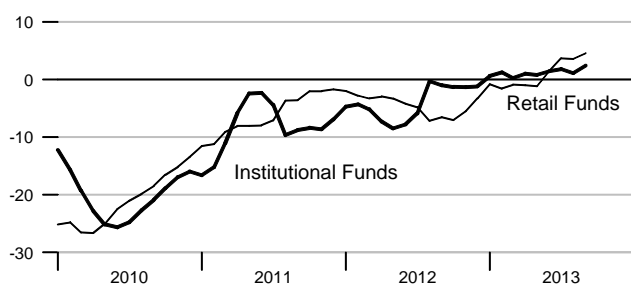
Checkable Deposits

Percent change from year ago



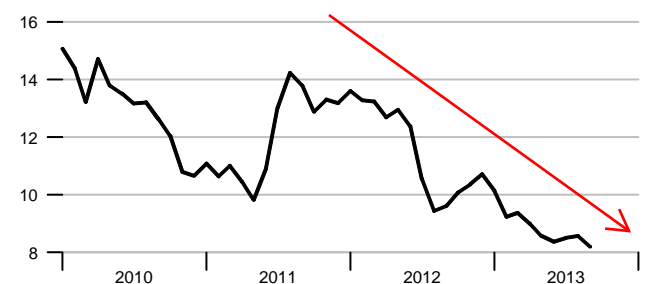
Money Market Mutual Fund Shares

Percent change from year ago

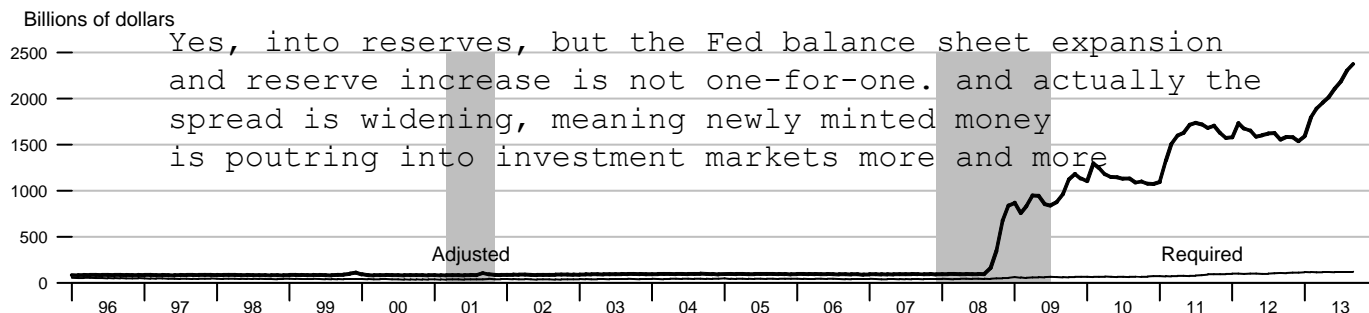


Savings Deposits

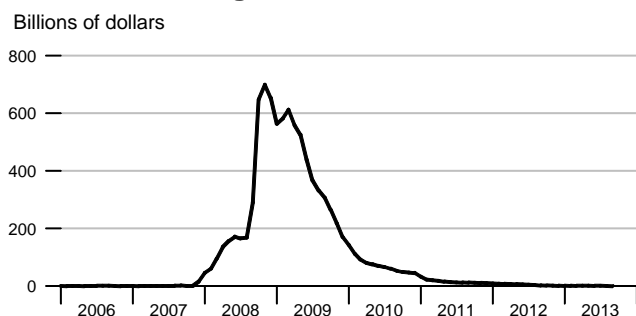
Percent change from year ago



Adjusted and Required Reserves



Total Borrowings

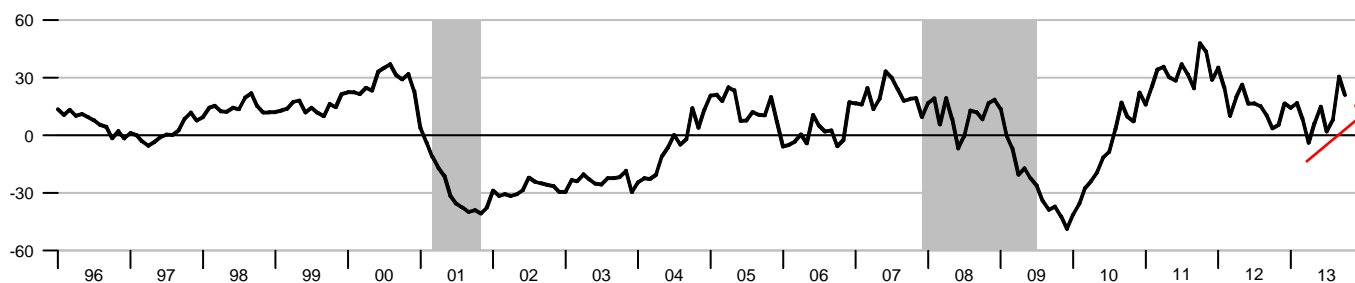


Excess Reserve Balances



Nonfinancial Commercial Paper

Percent change from year ago

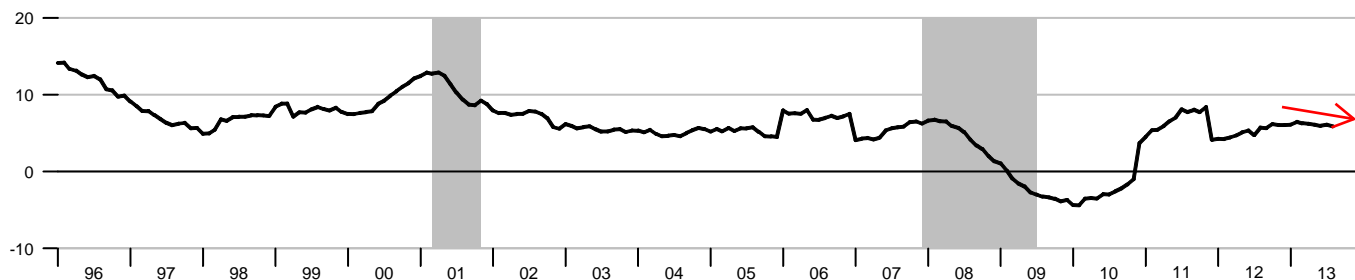


C paper growth is rebounding, alleviating some growth concerns

As of April 10, 2006, the Federal Reserve Board made major changes to its commercial paper calculations.
For more information, please refer to <http://www.federalreserve.gov/releases/cp/about.htm>.

Consumer Credit

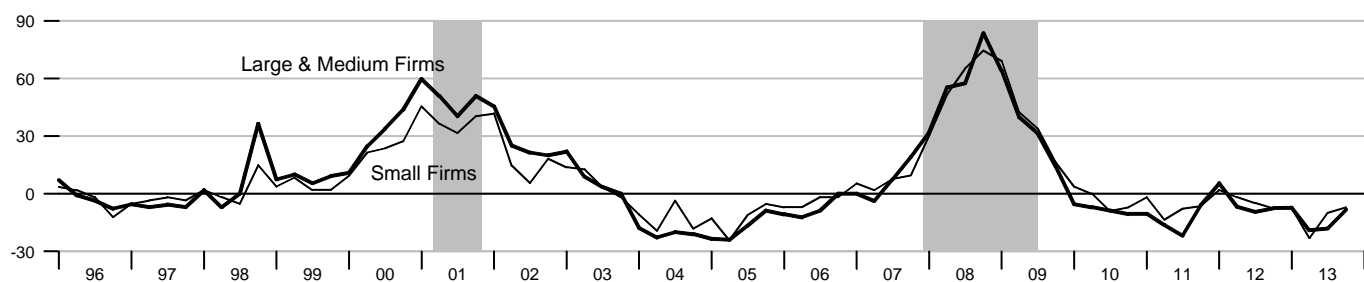
Percent change from year ago



Net Percentage of Domestic Banks Tightening Standards for Commercial and Industrial Loans

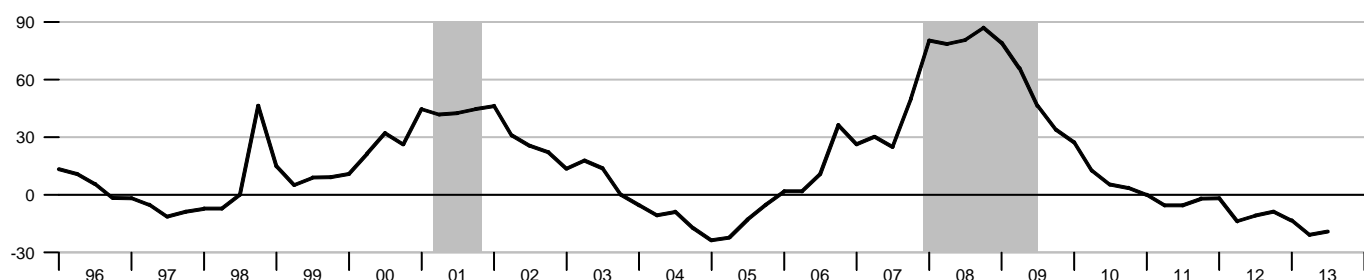
Percentage

Just remeber bank standards in regards to loan growth



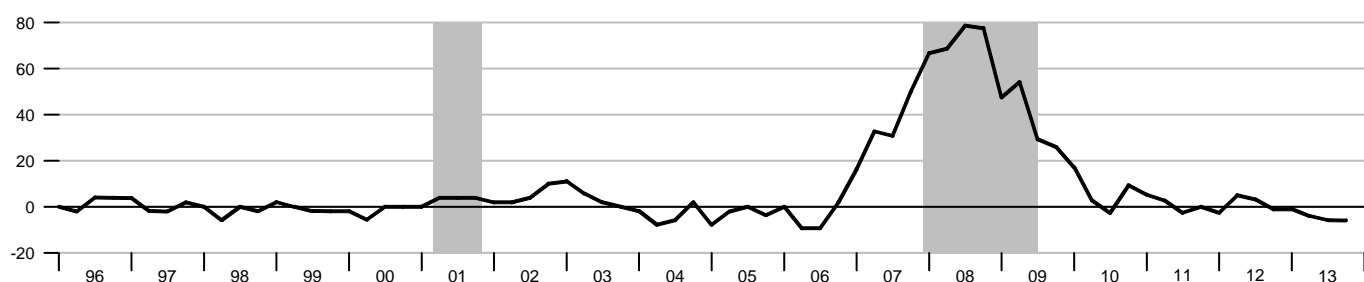
Net Percentage of Domestic Banks Tightening Standards for Commercial Real Estate Loans

Percentage



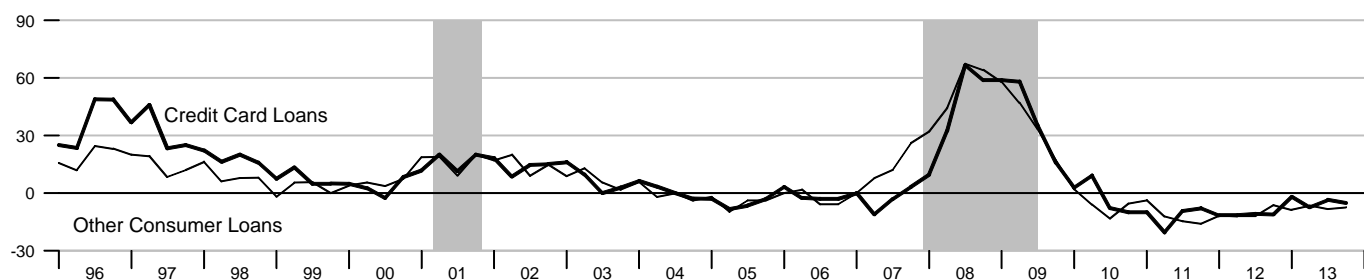
Net Percentage of Domestic Banks Tightening Standards for Residential Mortgage Loans

Percentage

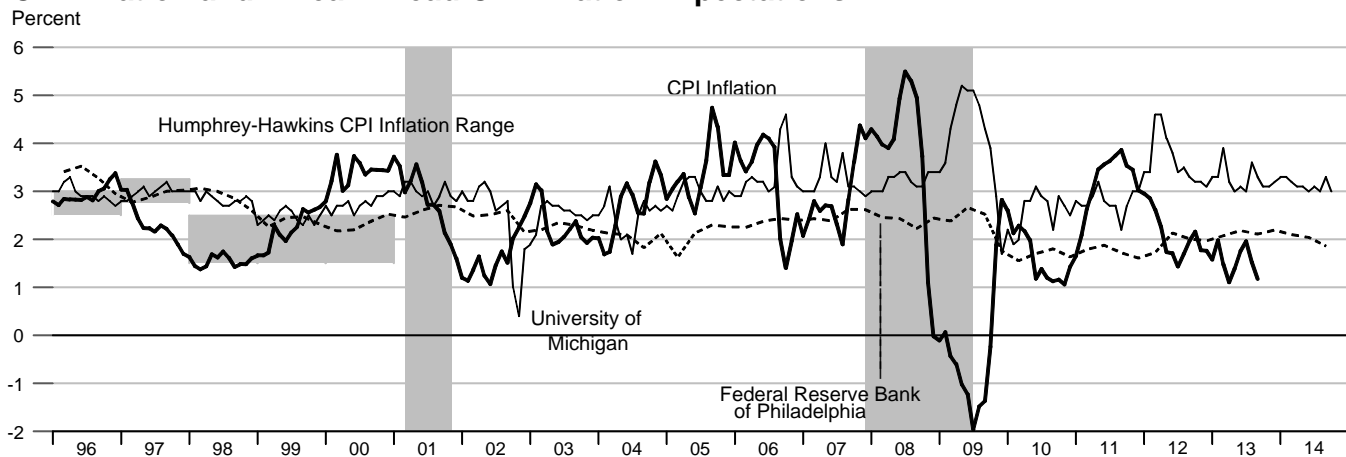


Net Percentage of Domestic Banks Tightening Standards for Consumer Loans

Percentage

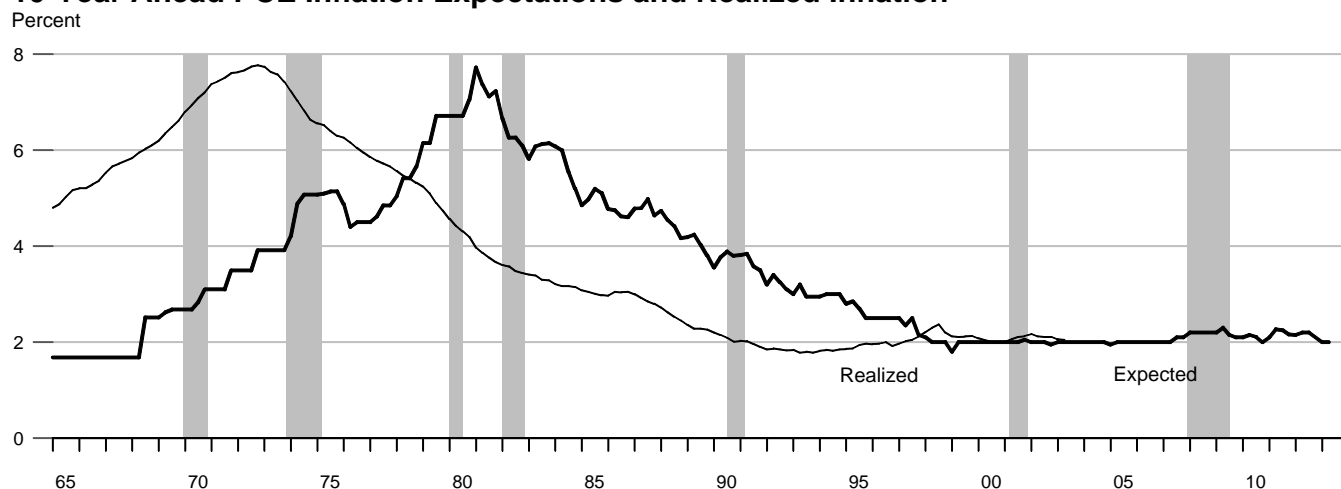


CPI Inflation and 1-Year-Ahead CPI Inflation Expectations



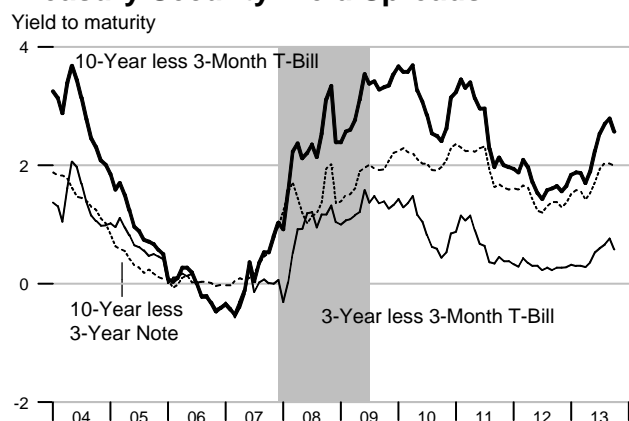
The shaded region shows the Humphrey-Hawkins CPI inflation range. Beginning in January 2000, the Humphrey-Hawkins inflation range was reported using the PCE price index and therefore is not shown on this graph.

10-Year Ahead PCE Inflation Expectations and Realized Inflation



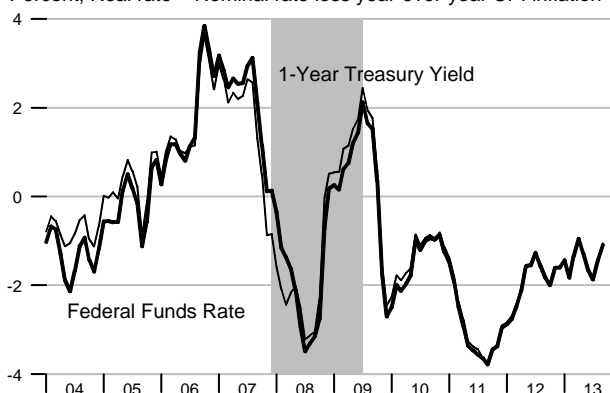
See the notes section for an explanation of the chart.

Treasury Security Yield Spreads

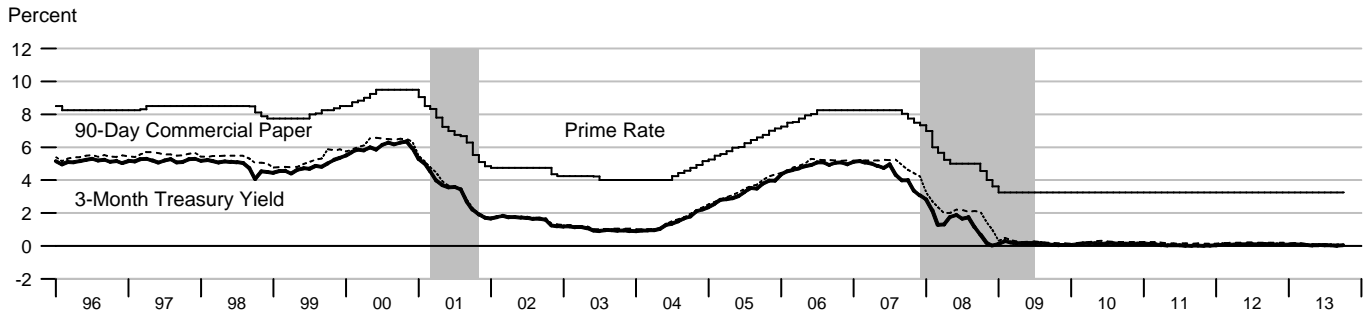


Real Interest Rates

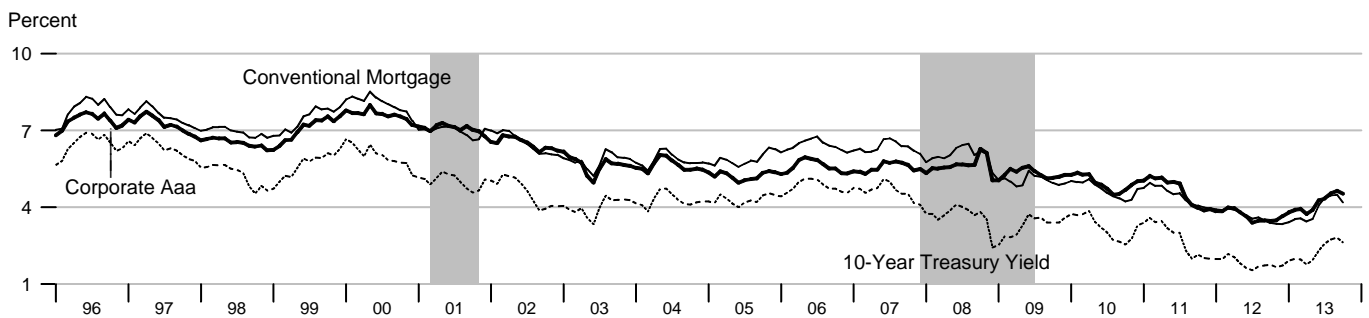
Percent, Real rate = Nominal rate less year-over-year CPI inflation



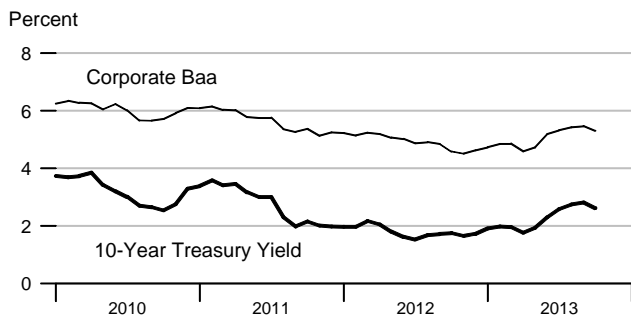
Short-Term Interest Rates



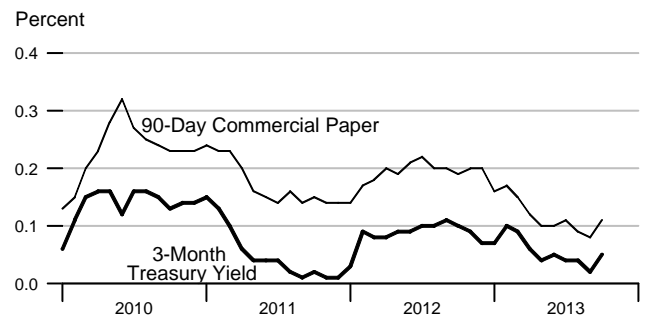
Long-Term Interest Rates



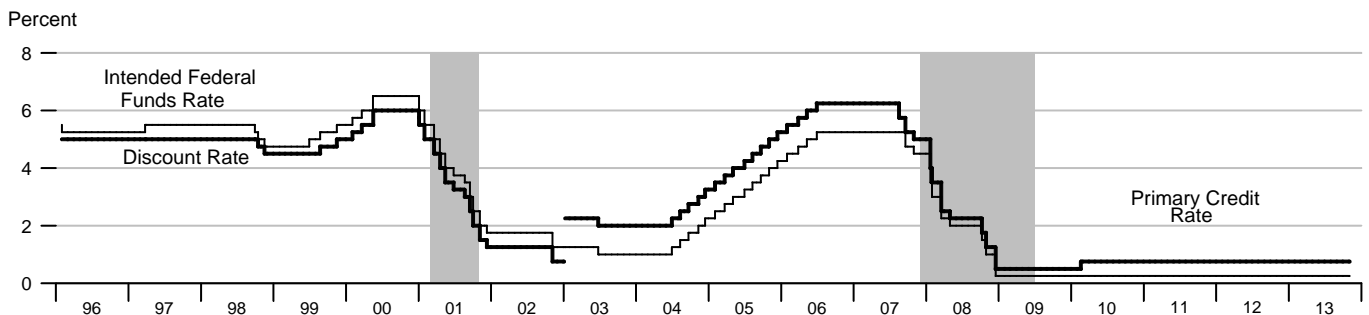
Long-Term Interest Rates



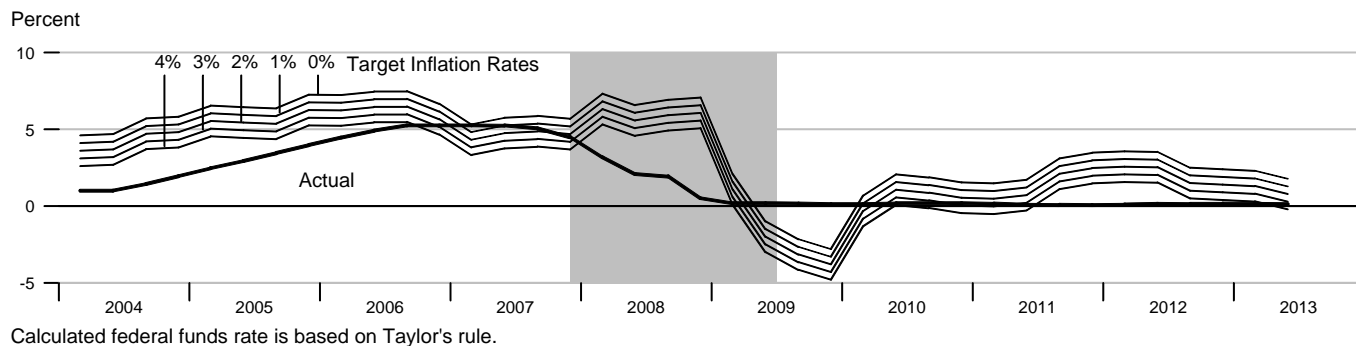
Short-Term Interest Rates



FOMC Intended Federal Funds Rate, Discount Rate, and Primary Credit Rate

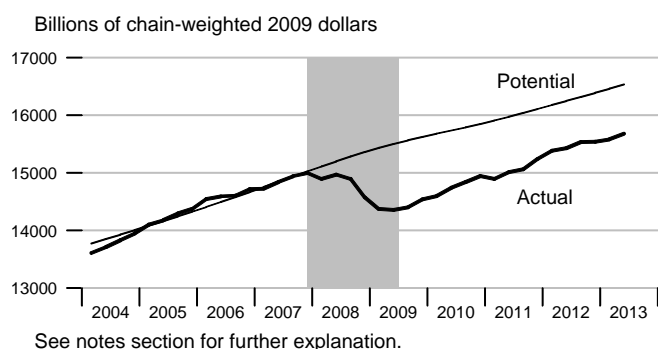


Federal Funds Rate and Inflation Targets

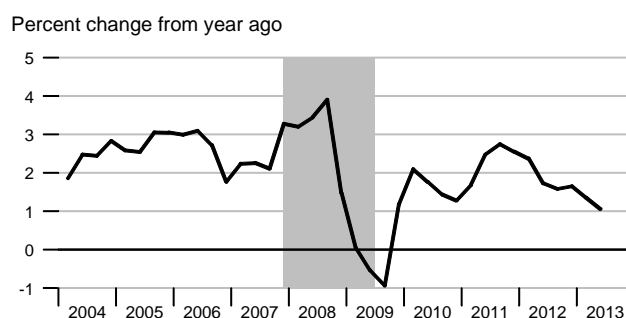


Components of Taylor's Rule

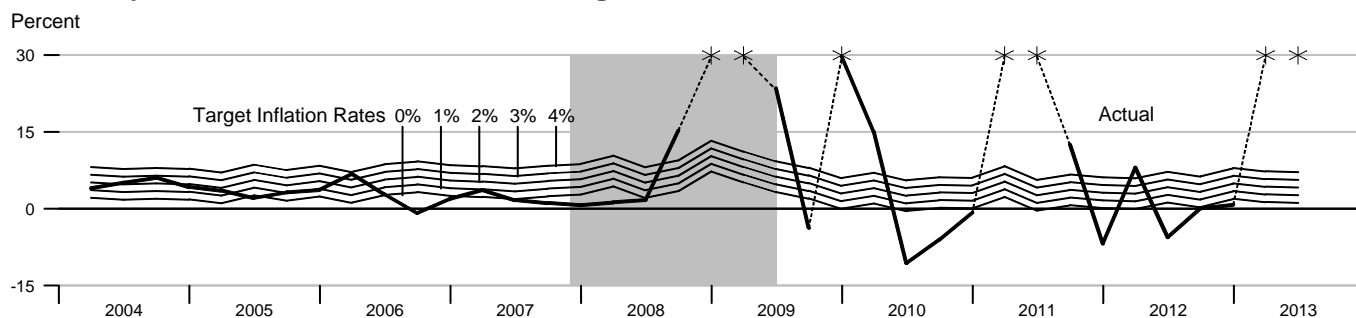
Actual and Potential Real GDP



PCE Inflation



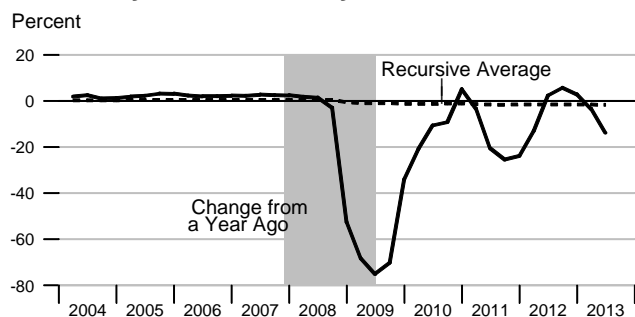
Monetary Base Growth and Inflation Targets



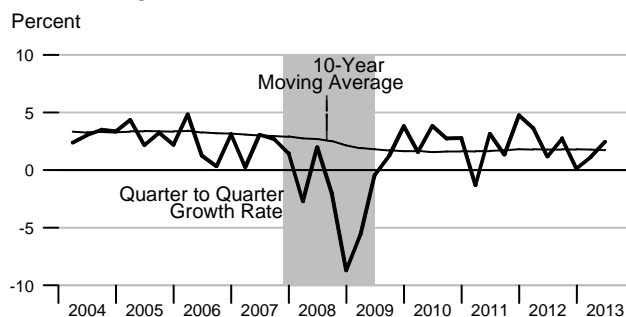
Calculated base growth is based on McCallum's rule. Actual base growth is percent change from the previous quarter. Stars represent actual values for 2008:Q4, 2009:Q4, 2011:Q1, 2011:Q2, 2013:Q1 and 2013:Q2 are 188.33%, 60.16%, 56.53%, 45.93%, 58.75%, 30.24% and 36.03%, respectively.

Components of McCallum's Rule

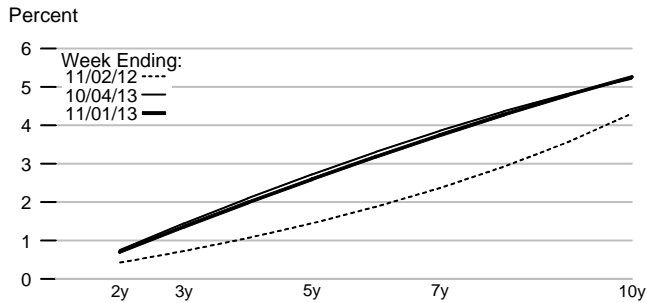
Monetary Base Velocity Growth



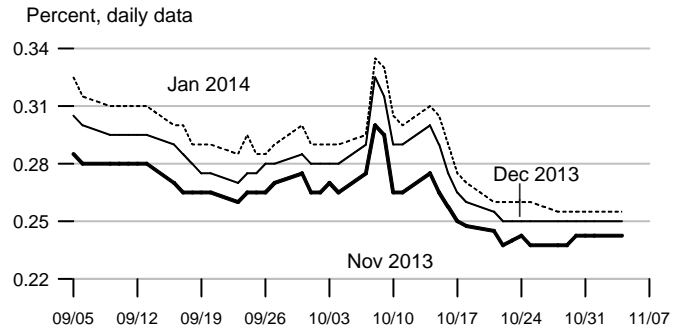
Real Output Growth



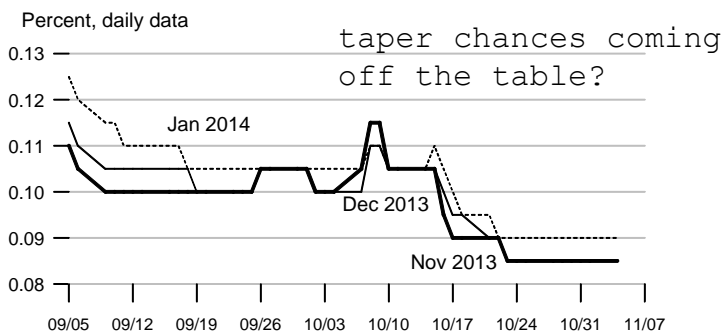
Implied One-Year Forward Rates



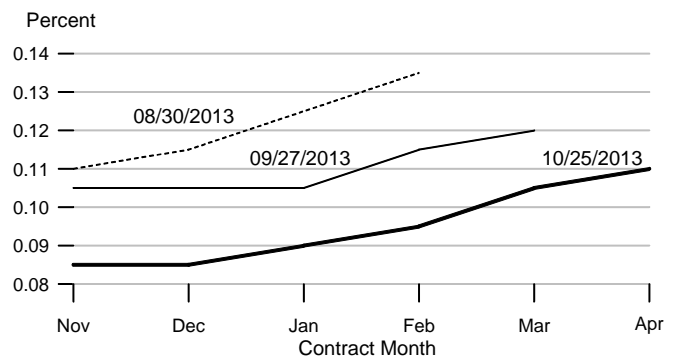
Rates on 3-Month Eurodollar Futures



Rates on Selected Federal Funds Futures Contracts

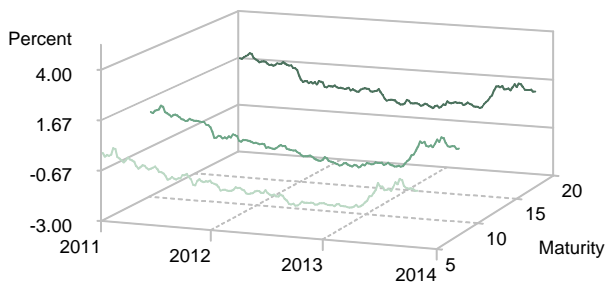


Rates on Federal Funds Futures on Selected Dates



Inflation-Indexed Treasury Securities

Weekly data



Note: Yields are inflation-indexed constant maturity U.S. Treasury securities

Inflation-Indexed Treasury Yield Spreads

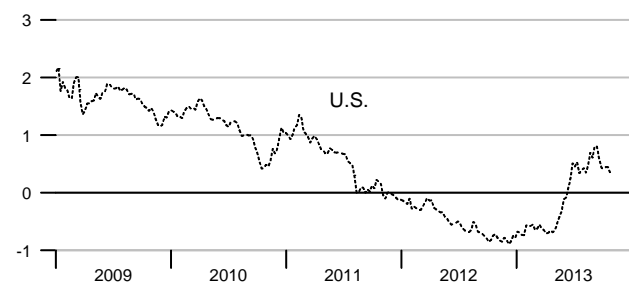
Weekly data



Note: Yield spread is between nominal and inflation-indexed constant maturity U.S. Treasury securities.

Inflation-Indexed 10-Year Government Notes

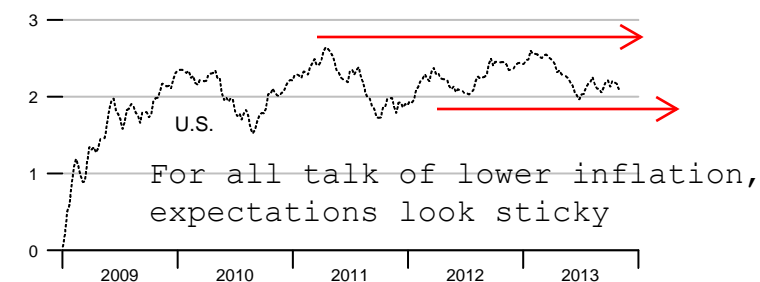
Percent, weekly data



Note: Data is temporarily unavailable for the French and U.K. 10-Year Notes and Government Yield Spreads.

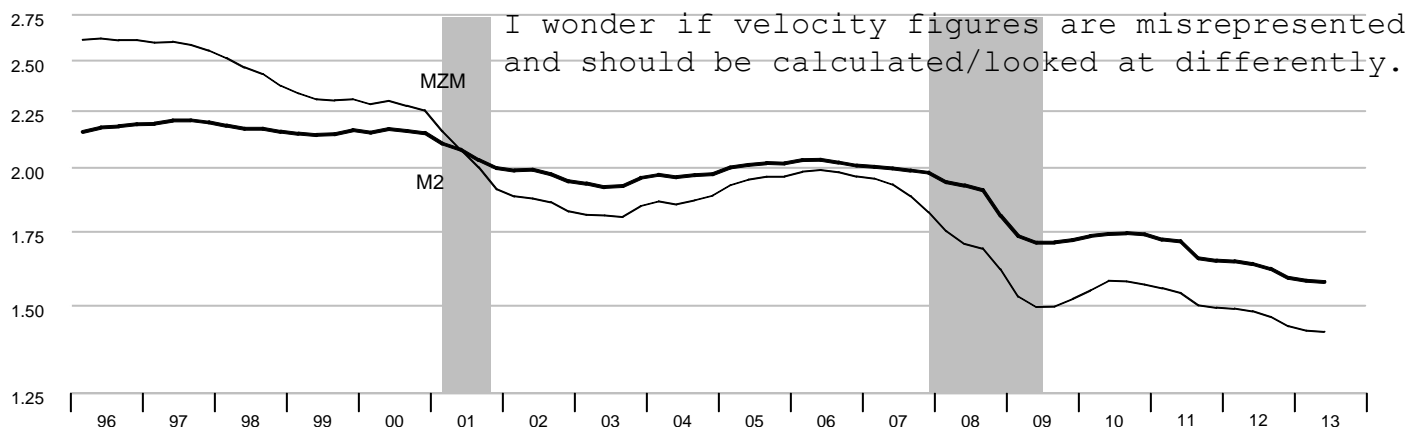
Inflation-Indexed 10-Year Government Yield Spreads

Percent, weekly data



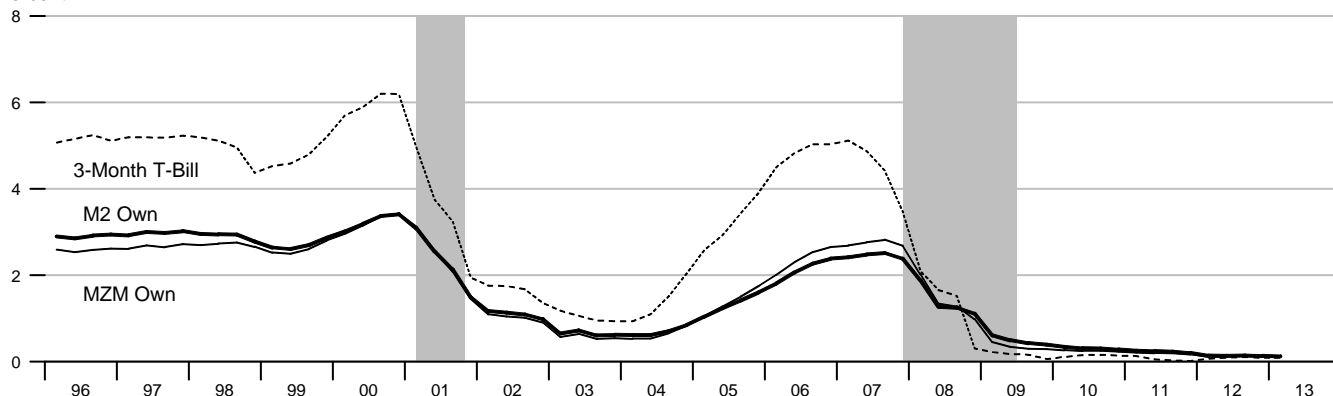
Velocity

Nominal GDP/MZM, Nominal GDP/M2 (Ratio Scale)



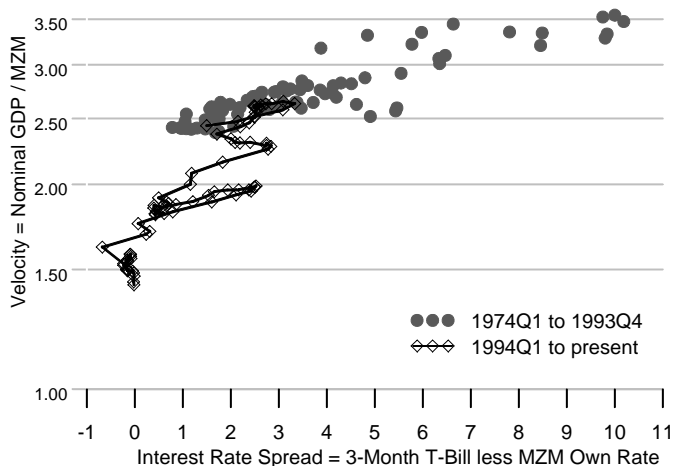
Interest Rates

Percent



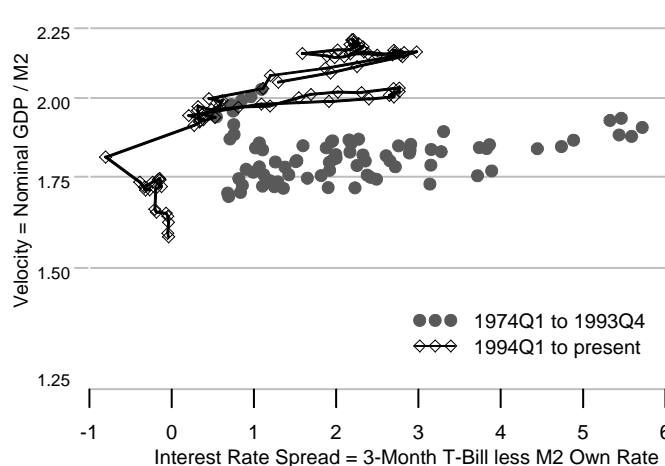
MZM Velocity and Interest Rate Spread

Ratio Scale



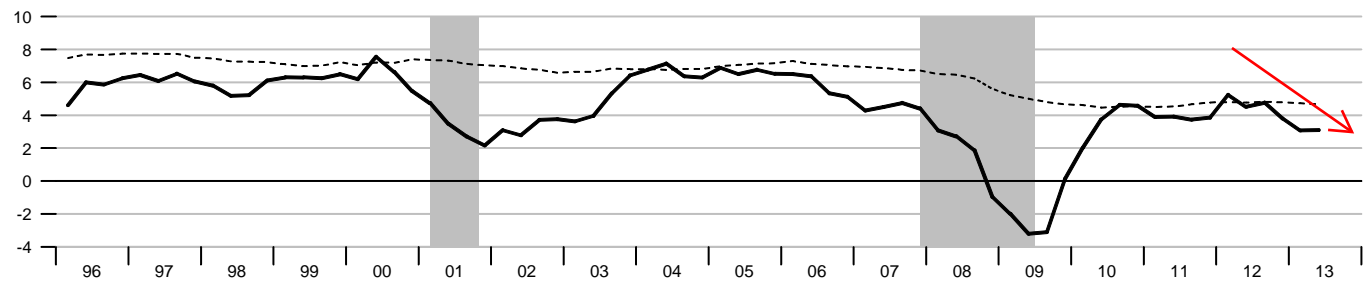
M2 Velocity and Interest Rate Spread

Ratio Scale



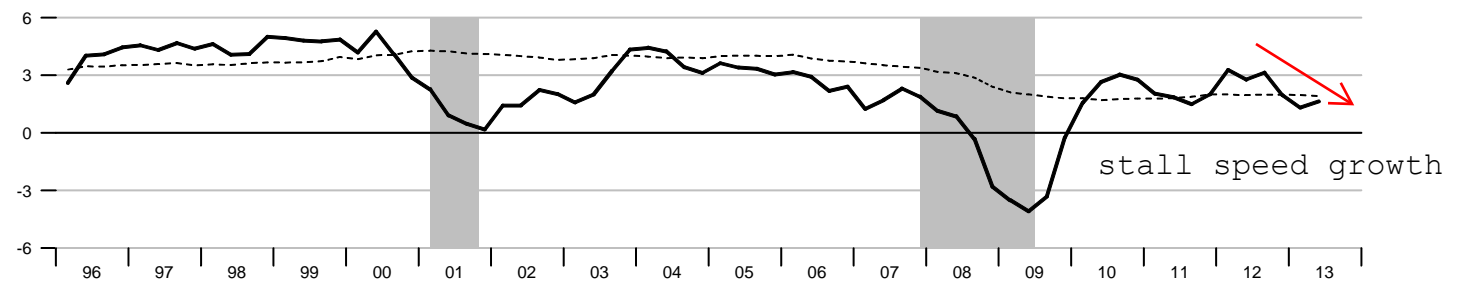
Gross Domestic Product

Percent change from year ago



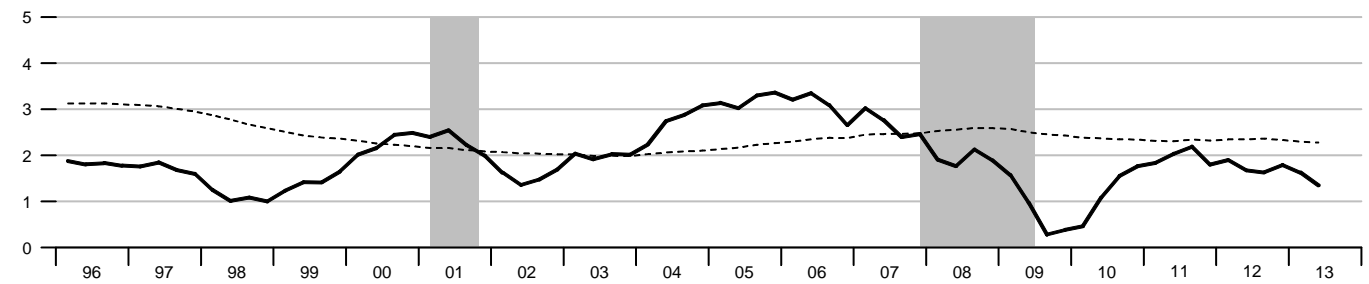
Real Gross Domestic Product

Percent change from year ago



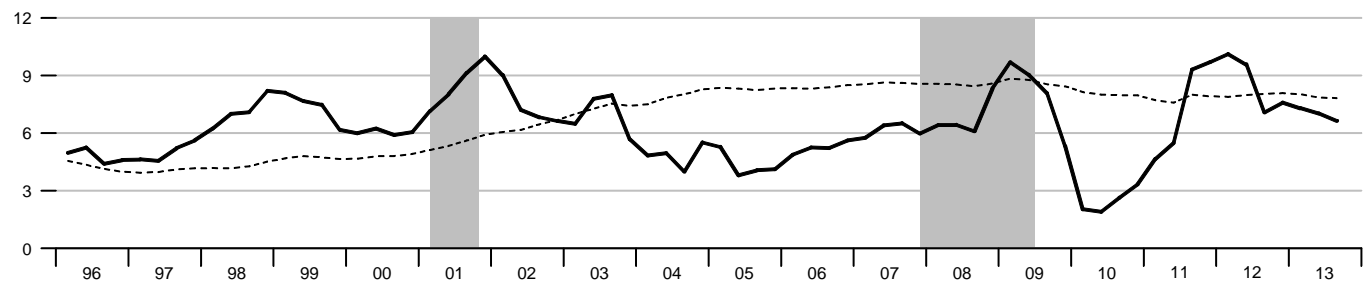
Gross Domestic Product Price Index

Percent change from year ago



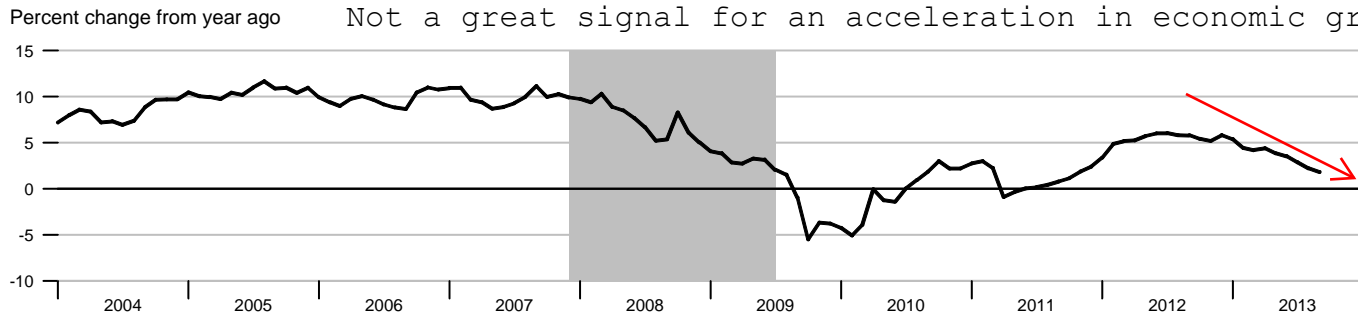
M2

Percent change from year ago



Bank Credit

as banks loosening standards, loan growth decelerates
Not a great signal for an acceleration in economic growth.



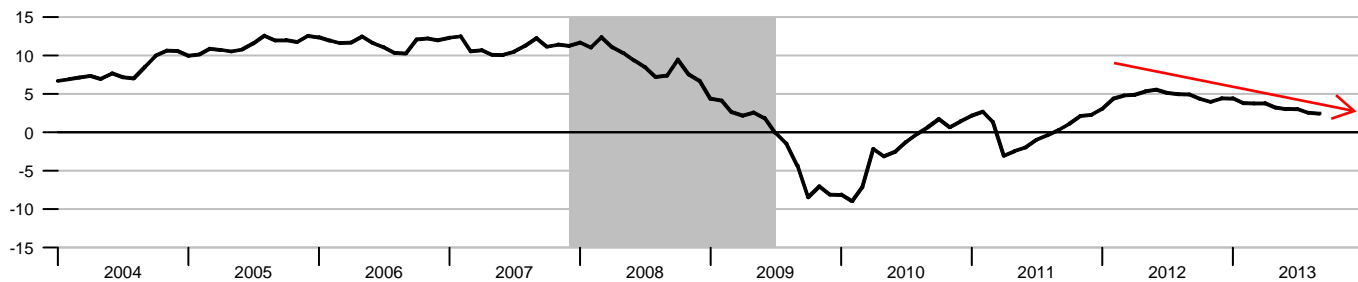
Investment Securities in Bank Credit at Commercial Banks

Percent change from year ago



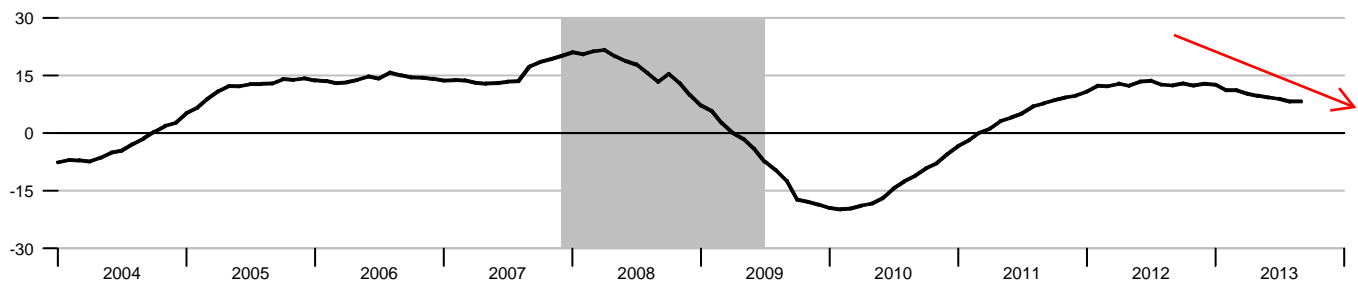
Total Loans and Leases in Bank Credit at Commercial Banks

Percent change from year ago

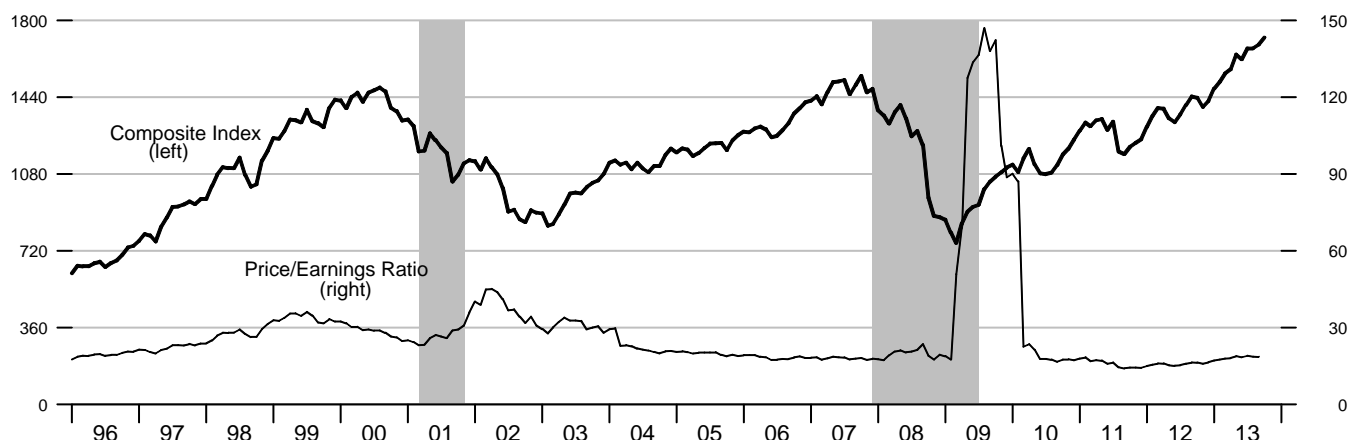


Commercial and Industrial Loans at Commercial Banks

Percent change from year ago



Standard & Poor's 500

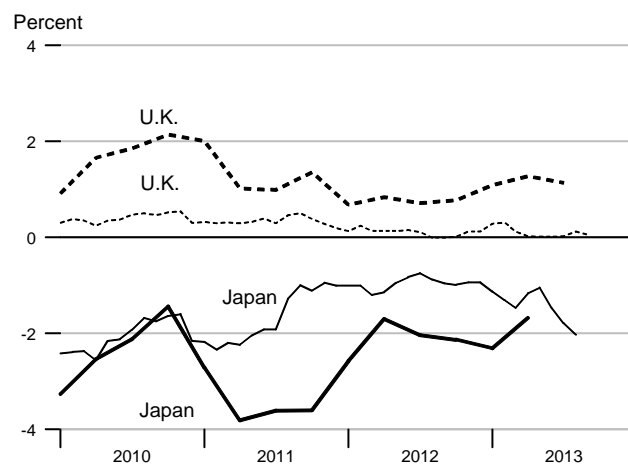
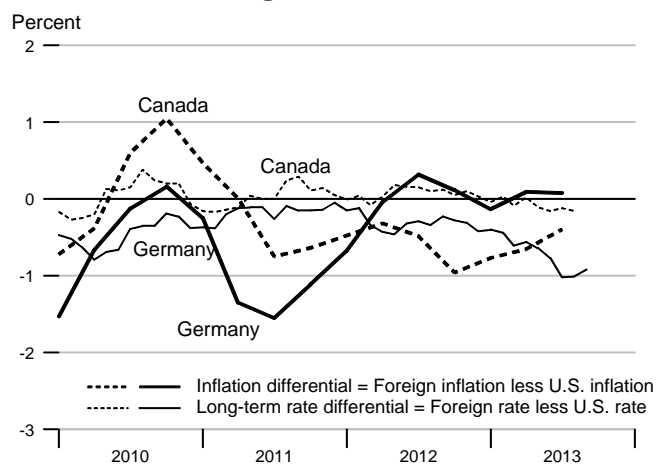


Recent Inflation and Long-Term Interest Rates

	Consumer Price Inflation Rates				Long-Term Government Bond Rates			
	Percent change from year ago				Percent			
	2012Q4	2013Q1	2013Q2	2013Q3	Jul13	Aug13	Sep13	Oct13
United States	1.90	1.68	1.42	1.55	2.58	2.74	2.81	2.62
Canada	0.94	0.91	0.76	1.15	2.46	2.58	.	.
France	1.54	1.07	0.81	0.95	2.25	2.36	2.49	.
Germany	2.01	1.55	1.51	1.63	1.56	1.73	1.89	.
Italy	2.47	1.91	1.16	1.13	4.42	4.42	4.54	.
Japan	-0.24	-0.63	-0.26	.	0.79	0.71	.	.
United Kingdom	2.67	2.77	2.69	2.69	2.60	2.86	2.86	.

* Copyright © , 2011, Organisation for Economic Cooperation and Development, OECD Main Economic Indicators (www.oecd.org).

Inflation and Long-Term Interest Rate Differentials



		Money Stock				Bank	Adjusted		
		M1	MZM	M2	M3*	Credit	Monetary Base	Reserves	MSI M2**
2008		1434.484	8707.039	7764.942		9102.355	1010.160	232.392	7622.050
2009		1637.745	9542.589	8385.944		9170.012	1796.556	944.368	8242.650
2010		1742.079	9536.636	8593.540		9123.025	2031.689	1143.690	8453.833
2011		2009.664	10203.89	9222.380		9225.031	2538.959	1576.503	9079.992
2012		2311.393	11058.93	10011.13		9720.857	2661.969	1611.903	9863.150
2011	1	1873.875	9796.964	8853.518		9132.920	2242.975	1310.136	8713.933
	2	1931.849	10034.34	9010.809		9150.386	2597.817	1647.222	8870.033
	3	2078.384	10398.52	9427.169		9242.012	2680.091	1713.491	9283.033
	4	2154.547	10585.74	9598.024		9374.806	2634.952	1635.163	9452.967
2012	1	2214.399	10756.83	9749.219		9540.616	2688.263	1662.512	9603.533
	2	2261.341	10898.09	9874.330		9668.137	2651.102	1615.813	9727.567
	3	2343.843	11157.68	10094.66		9786.496	2651.597	1601.126	9945.433
	4	2425.988	11423.13	10326.31		9888.181	2656.914	1568.164	10176.07
2013	1	2471.645	11607.79	10460.94		9985.809	2865.577	1760.056	10309.47
	2	2528.430	11724.25	10568.29		10047.81	3135.692	2025.829	10415.77
	3	2560.514	11972.98	10764.91		10011.80	3412.925	2287.585	10609.37
2011	Sep	2123.724	10491.85	9521.503		9275.805	2656.502	1682.241	9376.900
	Oct	2142.358	10531.47	9551.185		9327.604	2678.391	1706.483	9406.700
	Nov	2160.115	10588.78	9603.498		9390.089	2622.980	1627.223	9458.400
	Dec	2161.167	10636.98	9639.388		9406.725	2603.486	1571.783	9493.800
2012	Jan	2202.231	10717.20	9713.401		9468.248	2647.505	1579.387	9567.500
	Feb	2217.126	10749.98	9748.931		9564.529	2733.081	1732.832	9603.600
	Mar	2223.840	10803.33	9785.324		9589.071	2684.203	1675.316	9639.500
	Apr	2253.046	10847.45	9829.768		9629.253	2673.666	1654.388	9683.700
	May	2263.100	10896.72	9871.285		9671.404	2634.893	1587.890	9724.500
	Jun	2267.878	10950.11	9921.938		9703.753	2644.747	1605.160	9774.500
	Jul	2314.306	11063.05	10021.04		9756.012	2669.164	1621.475	9872.500
	Aug	2341.527	11157.49	10093.79		9788.052	2669.390	1626.134	9944.500
	Sep	2375.696	11252.51	10169.14		9815.425	2616.238	1555.768	10019.30
	Oct	2422.713	11341.34	10254.89		9832.051	2648.761	1584.757	10104.40
	Nov	2408.080	11399.20	10306.90		9878.265	2665.101	1581.304	10157.40
	Dec	2447.171	11528.84	10417.13		9954.226	2656.879	1538.430	10266.40
2013	Jan	2467.787	11606.74	10459.65		9979.278	2748.980	1594.014	10308.30
	Feb	2480.328	11591.70	10439.40		9986.666	2874.405	1794.638	10288.40
	Mar	2466.820	11624.93	10483.76		9991.484	2973.347	1891.515	10331.70
	Apr	2525.199	11690.22	10541.22		10052.97	3045.674	1954.982	10389.10
	May	2536.229	11712.97	10562.17		10043.90	3139.116	2013.758	10409.80
	Jun	2523.863	11769.55	10601.49		10046.57	3222.287	2108.746	10448.40
	Jul	2550.553	11896.92	10707.73		10036.53	3310.260	2184.862	10553.30
	Aug	2554.160	11964.71	10767.85		10005.37	3419.555	2303.576	10612.40
	Sep	2576.830	12057.31	10819.14		9993.484	3508.959	2374.316	10662.40

Note: All values are given in billions of dollars. *See table of contents for changes to the series.

		Federal Funds	Primary Credit Rate	Prime Rate	3-mo CDs	Treasury Yields			Corporate Aaa Bonds	Municipal Aaa Bonds	Conventional Mortgage
						3-mo	3-yr	10-yr			
2008		1.93	2.39	5.09	2.97	1.39	2.24	3.67	5.63	4.58	6.04
2009		0.16	0.50	3.25	0.56	0.15	1.43	3.26	5.31	4.27	5.04
2010		0.17	0.72	3.25	0.31	0.14	1.11	3.21	4.94	3.90	4.69
2011		0.10	0.75	3.25	0.30	0.05	0.75	2.79	4.64	4.26	4.46
2012		0.14	0.75	3.25	0.28	0.09	0.38	1.80	3.67	3.12	3.66
2011		1	0.16	0.75	3.25	0.28	0.13	1.16	5.13	4.71	4.85
		2	0.09	0.75	3.25	0.22	0.05	0.95	5.04	4.50	4.66
		3	0.08	0.75	3.25	0.29	0.02	0.47	4.46	4.02	4.31
		4	0.07	0.75	3.25	0.42	0.01	0.42	3.93	3.82	4.01
2012		1	0.10	0.75	3.25	0.33	0.07	0.42	3.89	3.31	3.92
		2	0.15	0.75	3.25	0.30	0.09	0.40	3.80	3.32	3.79
		3	0.14	0.75	3.25	0.27	0.10	0.35	3.45	3.05	3.55
		4	0.16	0.75	3.25	0.23	0.09	0.36	3.54	2.81	3.36
2013		1	0.14	0.75	3.25	0.22	0.09	0.39	3.88	3.01	3.50
		2	0.12	0.75	3.25	0.20	0.05	0.44	3.97	3.31	3.68
		3	0.08	0.75	3.25		0.03	0.71	4.51	3.86	4.44
2011		Oct	0.07	0.75	3.25	0.37	0.02	0.47	3.98	3.93	4.07
		Nov	0.08	0.75	3.25	0.41	0.01	0.39	3.87	3.79	3.99
		Dec	0.07	0.75	3.25	0.49	0.01	0.39	3.93	3.75	3.96
2012		Jan	0.08	0.75	3.25	0.40	0.03	0.36	3.85	3.48	3.92
		Feb	0.10	0.75	3.25	0.30	0.09	0.38	3.85	3.09	3.89
		Mar	0.13	0.75	3.25	0.29	0.08	0.51	3.99	3.37	3.95
		Apr	0.14	0.75	3.25	0.29	0.08	0.43	3.96	3.43	3.91
		May	0.16	0.75	3.25	0.29	0.09	0.39	3.80	3.20	3.80
		Jun	0.16	0.75	3.25	0.32	0.09	0.39	3.64	3.32	3.68
		Jul	0.16	0.75	3.25	0.30	0.10	0.33	3.40	3.18	3.55
		Aug	0.13	0.75	3.25	0.26	0.10	0.37	3.48	3.01	3.60
		Sep	0.14	0.75	3.25	0.24	0.11	0.34	3.49	2.96	3.50
		Oct	0.16	0.75	3.25	0.23	0.10	0.37	3.47	2.86	3.38
		Nov	0.16	0.75	3.25	0.23	0.09	0.36	3.50	2.76	3.35
		Dec	0.16	0.75	3.25	0.24	0.07	0.35	3.65	2.81	3.35
2013		Jan	0.14	0.75	3.25	0.23	0.07	0.39	3.80	2.83	3.41
		Feb	0.15	0.75	3.25	0.22	0.10	0.40	3.90	3.08	3.53
		Mar	0.14	0.75	3.25	0.21	0.09	0.39	3.93	3.13	3.57
		Apr	0.15	0.75	3.25	0.20	0.06	0.34	3.73	3.11	3.45
		May	0.11	0.75	3.25	0.20	0.04	0.40	3.89	3.13	3.54
		Jun	0.09	0.75	3.25	0.19	0.05	0.58	4.27	3.70	4.07
		Jul	0.09	0.75	3.25		0.04	0.64	4.34	3.73	4.37
		Aug	0.08	0.75	3.25		0.04	0.70	4.54	3.91	4.46
		Sep	0.08	0.75	3.25		0.02	0.78	4.64	3.94	4.49
		Oct	0.09	0.75	3.25		0.05	0.63	4.53		4.19

Note: All values are given as a percent at an annual rate.

		M1	M2M	M2	M3*
Percent change at an annual rate					
2008		4.50	14.06	6.82	
2009		14.17	9.60	8.00	
2010		6.37	-0.06	2.48	
2011		15.36	7.00	7.32	
2012		15.01	8.38	8.55	
2011	1	13.11	3.38	4.76	
	2	12.38	9.69	7.11	
	3	30.34	14.52	18.48	
	4	14.66	7.20	7.25	
2012	1	11.11	6.47	6.30	
	2	8.48	5.25	5.13	
	3	14.59	9.53	8.93	
	4	14.02	9.52	9.18	
2013	1	7.53	6.47	5.22	
	2	9.19	4.01	4.11	
	3	5.08	8.49	7.44	
2011	Sep	6.33	7.61	3.76	
	Oct	10.53	4.53	3.74	
	Nov	9.95	6.53	6.57	
	Dec	0.58	5.46	4.48	
2012	Jan	22.80	9.05	9.21	
	Feb	8.12	3.67	4.39	
	Mar	3.63	5.96	4.48	
	Apr	15.76	4.90	5.45	
	May	5.35	5.45	5.07	
	Jun	2.53	5.88	6.16	
	Jul	24.57	12.38	11.99	
	Aug	14.11	10.24	8.71	
	Sep	17.51	10.22	8.96	
	Oct	23.75	9.47	10.12	
	Nov	-7.25	6.12	6.09	
	Dec	19.48	13.65	12.83	
2013	Jan	10.11	8.11	4.90	
	Feb	6.10	-1.56	-2.32	
	Mar	-6.54	3.44	5.10	
	Apr	28.40	6.74	6.58	
	May	5.24	2.33	2.39	
	Jun	-5.85	5.80	4.47	
	Jul	12.69	12.99	12.03	
	Aug	1.70	6.84	6.74	
	Sep	10.65	9.29	5.72	

*See table of contents for changes to the series.

Definitions

M1: The sum of currency held outside the vaults of depository institutions, Federal Reserve Banks, and the U.S. Treasury; travelers checks; and demand and other checkable deposits issued by financial institutions (except demand deposits due to the Treasury and depository institutions), minus cash items in process of collection and Federal Reserve float.

MZM (money, zero maturity): M2 minus small-denomination time deposits, plus institutional money market mutual funds (that is, those included in M3 but excluded from M2). The label MZM was coined by William Poole (1991); the aggregate itself was proposed earlier by Motley (1988).

M2: M1 plus savings deposits (including money market deposit accounts) and small-denomination (under \$100,000) time deposits issued by financial institutions; and shares in retail money market mutual funds (funds with initial investments under \$50,000), net of retirement accounts.

M3: M2 plus large-denomination (\$100,000 or more) time deposits; repurchase agreements issued by depository institutions; Eurodollar deposits, specifically, dollar-denominated deposits due to nonbank U.S. addresses held at foreign offices of U.S. banks worldwide and all banking offices in Canada and the United Kingdom; and institutional money market mutual funds (funds with initial investments of \$50,000 or more).

Bank Credit: All loans, leases, and securities held by commercial banks.

Domestic Nonfinancial Debt: Total credit market liabilities of the U.S. Treasury, federally sponsored agencies, state and local governments, households, and nonfinancial firms. End-of-period basis.

Adjusted Monetary Base: The sum of currency in circulation outside Federal Reserve Banks and the U.S. Treasury, deposits of depository financial institutions at Federal Reserve Banks, and an adjustment for the effects of changes in statutory reserve requirements on the quantity of base money held by depositories. This series is a spliced chain index; see Anderson and Rasche (1996a,b, 2001, 2003).

Adjusted Reserves: The sum of vault cash and Federal Reserve Bank deposits held by depository institutions and an adjustment for the effects of changes in statutory reserve requirements on the quantity of base money held by depositories. This spliced chain index is numerically larger than the Board of Governors' measure, which excludes vault cash not used to satisfy statutory reserve requirements and Federal Reserve Bank deposits used to satisfy required clearing balance contracts; see Anderson and Rasche (1996a, 2001, 2003).

Monetary Services Index: An index that measures the flow of monetary services received by households and firms from their holdings of liquid assets; see Anderson, Jones, and Nesmith (1997). Indexes are shown for the assets included in M2, with additional data at research.stlouisfed.org/msi/index.html.

Note: M1, M2, M3, Bank Credit, and Domestic Nonfinancial Debt are constructed and published by the Board of Governors of the Federal Reserve System. For details, see *Statistical Supplement to the Federal Reserve Bulletin*, tables 1.21 and 1.26. MZM, Adjusted Monetary Base, Adjusted Reserves, and Monetary Services Index are constructed and published by the Research Division of the Federal Reserve Bank of St. Louis.

Notes

Page 3: Readers are cautioned that, since early 1994, the level and growth of M1 have been depressed by retail sweep programs that reclassify transactions deposits (demand deposits and other checkable deposits) as savings deposits overnight, thereby reducing banks' required reserves; see Anderson and Rasche (2001) and research.stlouisfed.org/aggreq/swdata.html. **Primary Credit Rate**, **Discount Rate**, and **Intended Federal Funds Rate** shown in the chart **Reserve Market Rates** are plotted as of the date of the change, while the **Effective Federal Funds Rate** is plotted as of the end of the month. Interest rates in the table are monthly averages from the Board of Governors H.15 Statistical Release. The **Treasury Yield Curve** and **Real Treasury Yield Curve** show constant maturity yields calculated by the U.S. Treasury for securities 5, 7, 10, and 20 years to maturity. **Inflation-Indexed Treasury Yield Spreads** are a measure of inflation compensation at those horizons, and it is simply the

nominal constant maturity yield less the real constant maturity yield. Daily data and descriptions are available at research.stlouisfed.org/fred2/. See also *Statistical Supplement to the Federal Reserve Bulletin*, table 1.35. The 30-year constant maturity series was discontinued by the Treasury as of February 18, 2002.

Page 5: **Checkable Deposits** is the sum of demand and other checkable deposits. **Savings Deposits** is the sum of money market deposit accounts and passbook and statement savings. **Time Deposits** have a minimum initial maturity of 7 days. **Retail Money Market Mutual Funds** are included in M2. **Institutional** money market funds are not included in M2.

Page 6: **Excess Reserve Balances** equals the amount of reserve balances maintained at depository institutions (DIs) less reserve balance requirements at DIs. **Total Borrowings** from the Federal Reserve is the sum of credit extended under the primary, second, and seasonal programs, as well as credit extended under the Term Asset-Backed Securities Loan Facility, and other credit extensions. [NOTE: Excess reserves and total borrowings are not seasonally adjusted.] The excess reserves calculation was changed with the introduction of the new H.3 statistical release, "Aggregate Reserves of Depository Institutions and the Monetary Base" on July 11, 2013. See <http://www.federalreserve.gov/releases/h3/current/>.

Page 7: Data are reported in the Senior Loan Officer Opinion Survey on Bank Lending Practices.

Page 8: **Inflation Expectations** measures include the quarterly Federal Reserve Bank of Philadelphia *Survey of Professional Forecasters*, the monthly University of Michigan Survey Research Center's *Surveys of Consumers*, and the annual Federal Open Market Committee (FOMC) range as reported to the Congress in the February testimony that accompanies the Monetary Policy Report to the Congress. Beginning February 2000, the FOMC began using the personal consumption expenditures (PCE) price index to report its inflation range; the FOMC then switched to the PCE chain-type price index excluding food and energy prices ("core") beginning July 2004. Accordingly, neither are shown on this graph. **CPI Inflation** is the percentage change from a year ago in the consumer price index for all urban consumers. **Real Interest Rates** are ex post measures, equal to nominal rates minus year-over-year CPI inflation.

From 1991 to the present the source of the long-term PCE inflation expectations data is the Federal Reserve Bank of Philadelphia's *Survey of Professional Forecasters*. Prior to 1991, the data were obtained from the Board of Governors of the Federal Reserve System. Realized (actual) inflation is the annualized rate of change for the 40-quarter period that corresponds to the forecast horizon (the expectations measure). For example, in 1965:Q1, annualized PCE inflation over the next 40 quarters was expected to average 1.7 percent. In actuality, the average annualized rate of change measured 4.8 percent from 1965:Q1 to 1975:Q1. Thus, the vertical distance between the two lines in the chart at any point is the forecast error.

Page 9: **FOMC Intended Federal Funds Rate** is the level (or midpoint of the range, if applicable) of the federal funds rate that the staff of the FOMC expected to be consistent with the desired degree of pressure on bank reserve positions. In recent years, the FOMC has set an explicit target for the federal funds rate.

Page 10: **Federal Funds Rate and Inflation Targets** shows the observed federal funds rate, quarterly, and the level of the funds rate implied by applying Taylor's (1993) equation

$$f_t^* = 2.5 + \pi_{t-1} + (\pi_{t-1} - \pi^*)/2 + 100 \times (y_{t-1} - y_{t-1}^P)/2$$

to five alternative target inflation rates, $\pi^* = 0, 1, 2, 3, 4$ percent, where f_t^* is the implied federal funds rate, π_{t-1} is the previous period's inflation rate (PCE) measured on a year-over-year basis, y_{t-1} is the log of the previous period's level of real gross domestic product (GDP), and y_{t-1}^P is the log of an estimate of the previous period's level of potential output. **Potential Real GDP** is estimated by the Congressional Budget Office (CBO).

Monetary Base Growth and Inflation Targets shows the quarterly growth of the adjusted monetary base implied by applying McCallum's (2000, p. 52) equation

$$\Delta b_t = \Delta x_t^* - \Delta v_t^a + \lambda (\Delta x_t^* - \Delta x_{t-1}),$$

$$\Delta x_t^* = \pi^* + \Delta y_t^*$$

to five alternative target inflation rates, $\pi^* = 0, 1, 2, 3, 4$ percent, where Δb_t is the implied growth rate of the adjusted monetary base, Δy_t^* is the 10-year moving average growth in real GDP, Δv_t^a is the average base velocity growth (calculated recursively), Δx_{t-1} is the lag growth rate of nominal GDP, and $\lambda = 0.5$.

Page 11: Implied One-Year Forward Rates are calculated by this Bank from Treasury constant maturity yields. Yields to maturity, $R(m)$, for securities with $m = 1, \dots, 10$ years to maturity are obtained by linear interpolation between reported yields. These yields are smoothed by fitting the regression suggested by Nelson and Siegel (1987),

$$R(m) = a_0 + (a_1 + a_2)(1 - e^{-m/50})/(m/50) - a_2 \times e^{-m/50},$$

and forward rates are calculated from these smoothed yields using equation (a) in table 13.1 of Shiller (1990),

$$f(m) = [D(m)R(m) - D(m-1)] / [D(m) - D(m-1)],$$

where duration is approximated as $D(m) = (1 - e^{-R(m) \times m})/R(m)$. These rates are linear approximations to the true instantaneous forward rates; see Shiller (1990). For a discussion of the use of forward rates as indicators of inflation expectations, see Sharpe (1997). **Rates on 3-Month Eurodollar Futures** and **Rates on Selected Federal Funds Futures Contracts** trace through time the yield on three specific contracts. **Rates on Federal Funds Futures on Selected Dates** displays a single day's snapshot of yields for contracts expiring in the months shown on the horizontal axis. **Inflation-Indexed Treasury Securities and Yield Spreads** are those plotted on page 3. **Inflation-Indexed 10-Year Government Notes** shows the yield of an inflation-indexed note that is scheduled to mature in approximately (but not greater than) 10 years. The current French note has a maturity date of 7/25/2015, the current U.K. note has a maturity date of 4/16/2020, and the current U.S. note has a maturity date of 11/15/2020. **Inflation-Indexed Treasury Yield Spreads** and **Inflation-Indexed 10-Year Government Yield Spreads** equal the difference between the yields on the most recently issued inflation-indexed securities and the unadjusted security yields of similar maturity.

Page 12: Velocity (for MZM and M2) equals the ratio of GDP, measured in current dollars, to the level of the monetary aggregate. **MZM** and **M2 Own Rates** are weighted averages of the rates received by households and firms on the assets included in the aggregates. Prior to 1982, the 3-month T-bill rates are secondary market yields. From 1982 forward, rates are 3-month constant maturity yields.

Page 13: Real Gross Domestic Product is GDP as measured in chained 2009 dollars. The **Gross Domestic Product Price Index** is the implicit price deflator for GDP, which is defined by the Bureau of Economic Analysis, U.S. Department of Commerce, as the ratio of GDP measured in current dollars to GDP measured in chained 2009 dollars.

Page 14: Investment Securities are all securities held by commercial banks in both investment and trading accounts.

Page 15: Inflation Rate Differentials are the differences between the foreign consumer price inflation rates and year-over-year changes in the U.S. all-items Consumer Price Index.

Page 17: Treasury Yields are Treasury constant maturities as reported in the Board of Governors of the Federal Reserve System's H.15 release.

Sources

Agence France Trésor: French note yields.

Bank of Canada: Canadian note yields.

Bank of England: U.K. note yields.

Board of Governors of the Federal Reserve System:

Monetary aggregates and components: H.6 release. Bank credit and components: H.8 release. Consumer credit: G.19 release. Required reserves, excess reserves, clearing balance contracts, and discount window borrowing: H.4.1 and H.3 releases. Interest rates: H.15 release. Nonfinancial commercial paper: Board of Governors website. Nonfinancial debt: Z.1 release. M2 own rate. Senior Loan Officer Opinion Survey on Bank Lending Practices.

Bureau of Economic Analysis: GDP.

Bureau of Labor Statistics: CPI.

Chicago Board of Trade: Federal funds futures contract.

Chicago Mercantile Exchange: Eurodollar futures.

Congressional Budget Office: Potential real GDP.

Federal Reserve Bank of Philadelphia: Survey of Professional Forecasters inflation expectations.

Federal Reserve Bank of St. Louis: Adjusted monetary base and adjusted reserves, monetary services index, MZM own rate, one-year forward rates.

Organization for Economic Cooperation and Development: International interest and inflation rates.

Standard & Poor's: Stock price-earnings ratio, stock price composite index.

University of Michigan Survey Research Center: Median expected price change.

U.S. Department of the Treasury: U.S. security yields.

References

- Anderson, Richard G. and Robert H. Rasche (1996a). "A Revised Measure of the St. Louis Adjusted Monetary Base," *Federal Reserve Bank of St. Louis Review*, March/April, 78(2), pp. 3-13.*
- ____ and ____ (1996b). "Measuring the Adjusted Monetary Base in an Era of Financial Change," *Federal Reserve Bank of St. Louis Review*, November/December, 78(6), pp. 3-37.*
- ____ and ____ (2001). "Retail Sweep Programs and Bank Reserves, 1994-1999," *Federal Reserve Bank of St. Louis Review*, January/February, 83(1), pp. 51-72.*
- ____ and ____ , with Jeffrey Loesel (2003). "A Reconstruction of the Federal Reserve Bank of St. Louis Adjusted Monetary Base and Reserves," *Federal Reserve Bank of St. Louis Review*, September/October, 85(5), pp. 39-70.*
- ____ , Barry E. Jones and Travis D. Nesmith (1997). "Special Report: The Monetary Services Indexes Project of the Federal Reserve Bank of St. Louis," *Federal Reserve Bank of St. Louis Review*, January/February, 79(1), pp. 31-82.*
- McCallum, Bennett T. (2000). "Alternative Monetary Policy Rules: A Comparison with Historical Settings for the United States, the United Kingdom, and Japan," *Federal Reserve Bank of Richmond Economic Quarterly*, vol. 86/1, Winter.
- Motley, Brian (1988). "Should M2 Be Redefined?" *Federal Reserve Bank of San Francisco Economic Review*, Winter, pp. 33-51.
- Nelson, Charles R. and Andrew F. Siegel (1987). "Parsimonious Modeling of Yield Curves," *Journal of Business*, October, pp. 473-89.
- Poole, William (1991). Statement before the Subcommittee on Domestic Monetary Policy of the Committee on Banking, Finance and Urban Affairs, U.S. House of Representatives, November 6, 1991. Government Printing Office, Serial No. 102-82.
- Sharpe, William F. (1997). *Macro-Investment Analysis*, on-line textbook available at www.stanford.edu/~wfsarpe/mia/mia.htm.
- Shiller, Robert (1990). "The Term Structure of Interest Rates," *Handbook of Monetary Economics*, vol. 1, B. Friedman and F. Hahn, eds., pp. 627-722.
- Taylor, John B. (1993). "Discretion versus Policy Rules in Practice," *Carnegie-Rochester Conference Series on Public Policy*, vol. 39, pp. 195-214.
- Note:** *Available on the Internet at research.stlouisfed.org/publications/review/.